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| <b>(21) International Application Number:</b> PCT/NL95/00017<br><b>(22) International Filing Date:</b> 13 January 1995 (13.01.95)<br><br><b>(30) Priority Data:</b><br>9400065 14 January 1994 (14.01.94) NL<br><br><b>(71) Applicant (for all designated States except US):</b> AMAFILTER BV [NL/NL]; Kwakelkade 28, NL-1823 CL Alkmaar (NL).<br><br><b>(72) Inventor; and</b><br><b>(75) Inventor/Applicant (for US only):</b> PLAISIER, Leendert [NL/NL]; Kwakelkade 28, NL-1823 CL Alkmaar (NL).<br><br><b>(74) Agent:</b> KOOMEN, M., J., I; Kennemerstraatweg 35-37, NL-1814 GB Alkmaar (NL).  |           | <b>(81) Designated States:</b> AU, CA, CZ, RU, UA, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).<br><br><b>Published</b><br><i>With international search report.<br/>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.<br/>In English translation (filed in Dutch).</i> |
| <b>(54) Title:</b> FILTER ELEMENT<br><br><b>(57) Abstract</b><br><br>Leaf filter element, which filter element is intended to be installed standing or hanging within a filter vessel, which filter element is formed by a supporting or mounting frame, within which a flat leaf shaped filtration part, such as supporting wire netting covered on both sides by filter gauze, is mounted, which filter element further is provided with means for the discharge of the filtrate to a manifold and with further means for hanging or supporting the element in the filter vessel, while the element further is provided with at least two supporting elements, extending between two or more parts of the supporting or mounting frame, which supporting elements divide the element, more in particular the filtration part, into at least three sectors. |           |  |

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Filter element.

The invention relates to a leaf filter element, which filter element is intended to be installed standing or hanging within a filter vessel, which filter element is formed by a supporting- or mounting frame, within which a flat leaf shaped filtration part, such as supporting wire netting covered on both sides by filter gauze, is provided, which filter element further is provided with means for the discharge of the filtrate to a manifold and with further means for hanging or supporting the element in the filter vessel.

Such a leaf filter element is generally known.

To improve the rigidity thereof, the known larger sized filter elements are provided in the center part with a supporting element, which extends between opposed frame parts.

The known filter element can further be provided with a connecting element for the connection to a vibrator, by means of which the filter cake formed on the filter element can be discharged.

With the known filter element the forces which are generated, via the single joint between the filter element and a vibrator, by the vibrator onto the filter medium, do not move over the filter medium in a uniform manner, so that it is possible that the forces applied at a certain location to the filter medium are insufficient to loosen the filter cake, while at another location the forces applied to the filter medium are stronger than is necessary for the filter cake to loosen, whereby it is further possible that the filter medium locally is strained more than is admissable.

It is the object of the present invention to obviate this drawback of the known filter element.

The filter element according to the invention thereto is characterized, in that the element is provided with  
5 at least two supporting elements, each extending between two or more parts of the supporting- or mounting frame, which supporting elements divide the element, more in particular the filtration part, into at least three sectors.

10 According to a further characteristic of the filter element according to the invention, means are provided for connecting the element to a vibrator mounted within the filter vessel, by means of which the filter cake formed on the filter element can be discharged, whereby  
15 the means are formed by at least two connecting elements, mounted to a frame part at a distance from one another, for the connection of the element to a vibrator.

By using more than one supporting element as described  
20 above and by the further application of two connecting elements for the connection of the filter element to the vibrator it is achieved that the vibrations which are transferred by the vibrator to the element are distributed over the filter medium in a more uniform  
25 manner, so that a complete loosening of the filter cake may be achieved in a manner which involves less straining of the filter medium.

In a favourable way the connecting elements for the connection of the element to a vibrator are mounted to  
30 a frame part at the place of the connections between the supporting elements and the frame part.

An embodiment of the element according to the invention

will now be described further with reference to the drawing of an example of an embodiment.

In the drawing is shown a front view of the filter element according to the invention.

5 As can be seen in the drawing, the filter element is formed by a supporting- or mounting frame 1, within which a flat leaf shaped filtration part 2, such as supporting wire netting, covered on both sides by filter gauze, is mounted. The filter element is provided with means 3 for the discharge of the filtrate to a manifold 4. The element is provided with at least two supporting elements 5, each extending between opposed frame parts 1, which divide the element, more in particular the filtration part 2, in at least three sectors 6.

15 As can be seen in the drawing, the sectors have substantially the same size. Onto a frame part 1 two connecting elements 7 are mounted at a distance from one another for the connection of the element to a vibrator. The connecting elements 7 are mounted at the location of the connections 8 between the supporting elements 5 and the frame part 1.

20 The example of the embodiment shown in the drawing further is provided with two supports 9, mounted to a frame part 1 at a distance from one another, which are provided to the frame part 1 at the location of the connections 8 between the supporting elements 5 and the frame part 1.

25 Substantially transverse in relation to the supporting elements 5 a support strip 10 is provided over the filtration part 2, which divides the filtration part 2 in the element in two sectors 11.

## C l a i m s

1. Leaf filter element, which filter element is intended to be installed standing or hanging within a filter vessel, which filter element is formed by a supporting-  
5 or mounting frame, within which a flat leaf shaped filtration part, such as supporting wire netting covered on both sides by filter gauze, is mounted, which filter element further is provided with means for the discharge of the filtrate to a manifold and with further  
10 means for hanging or supporting the element in the filter vessel, characterized in that the element is provided with at least two supporting elements, extending between two or more parts of the supporting- or mounting frame, which supporting elements divide the  
15 element, more in particular the filtration part, into at least three sectors.
2. Filter element according to claim 1, characterized in that the supporting elements extend vertically.
3. Filter element according to claim 1 or 2, characterized  
20 in that the sectors have substantially the same size.
4. Filter element according to claim 1, 2 or 3, characterized in that means are provided for connecting the  
25 element to a vibrator mounted within the filter vessel, by means of which the filter cake formed on the filter element can be discharged, whereby the means are formed by at least two connecting elements, provided onto a frame part at a distance from one onto another, for the  
30 connection of the element to a vibrator.
5. Filter element according to claim 4, characterized in that the connecting elements for the connection of the element to a vibrator are mounted to a frame

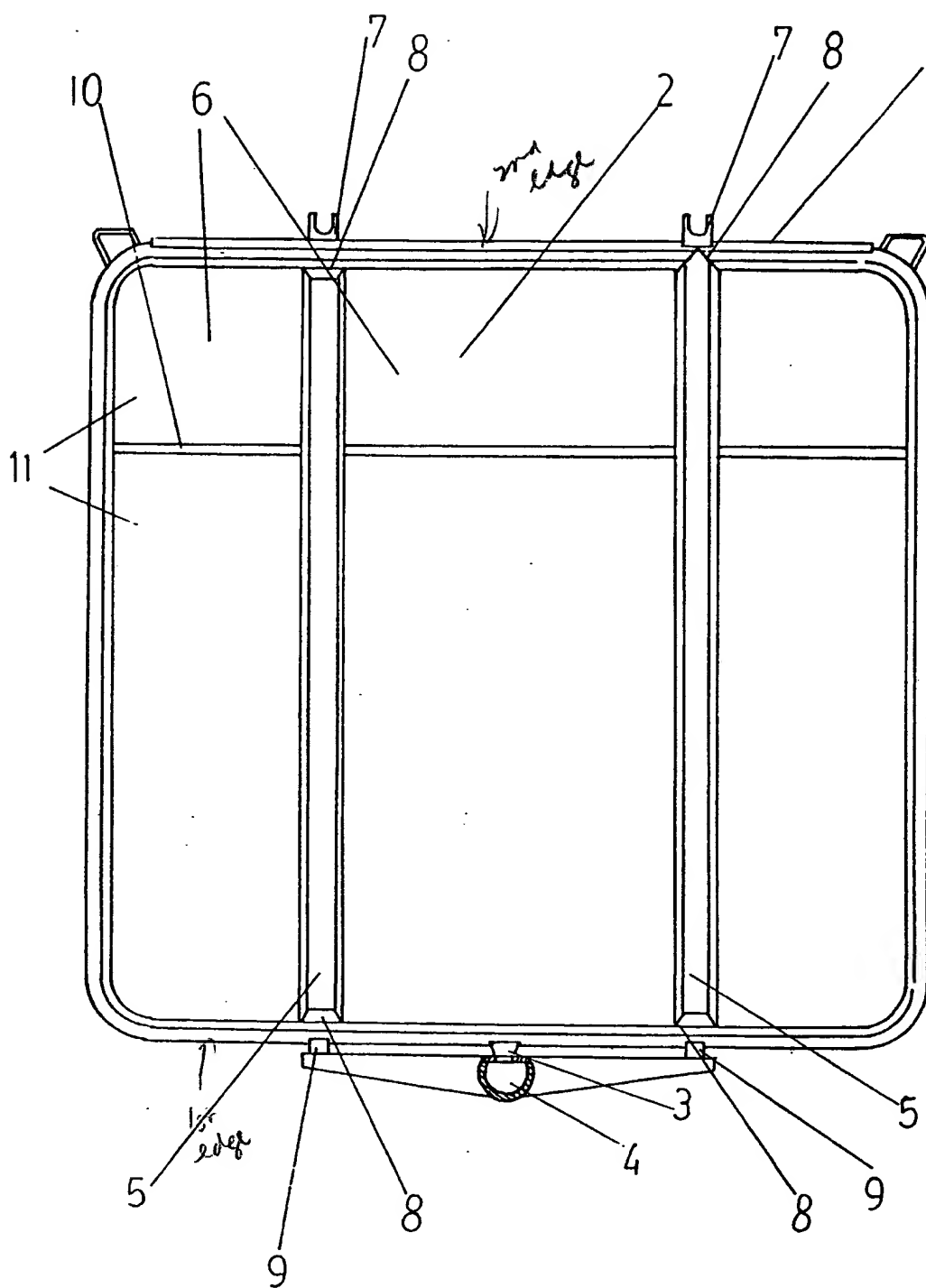
part at the location of the connections of the supporting elements to the frame part.

5 6. Filter element according to one of the preceding claims, characterized in that the means for supporting the filter elements in the filter vessel are formed by at least two supports, which are provided onto a frame part at a distance from one another.

10 7. Filter element according to claim 6, characterized in that the supports are provided onto a frame part at the locations of the connections of the supporting elements to the frame part.

15 8. Filter element according to one of the preceding claims, characterized in that the element is provided with at least one support strip, mounted over the filtration part, and extending substantially transverse in relation to the supporting elements, which divides the filtration part in the element into at least two sectors.

20 9. Filter element according to claim 8, characterized in that the size ratio of the sectors is 1:2.





## INTERNATIONAL SEARCH REPORT

national Application No  
PCT/NL 95/00017

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 B01D29/39

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 B01D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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| Y          | US,A,4 369 109 (WILLIAM F. EDGE) 18<br>January 1983<br>see figure 1<br>---                                     | 1                     |
| X          | US,A,2 568 085 (JOHN J. NAUGLE) 18<br>September 1951<br>see column 3, line 32 - line 49; figures<br>3,4<br>--- | 1-3                   |
| X          | FR,A,359 886 (ERNEST-LOUIS TANCHON) 6<br>April 1906<br>see the whole document<br>---                           | 1-3                   |
|            | -/--   |                       |

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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| A          | GB,A,658 610 (HENRY WEBB WAGHORN) 10<br>October 1951<br>see page 2, line 28 - line 42; figures<br>---       | 4                     |
| A,P        | WO,A,94 14518 (AMAFILTER) 7 July 1994<br>see figure 1<br>-----  | 1                     |

## INTERNATIONAL SEARCH REPORT

Information on patent family members

national Application No

PCT/NL 95/00017

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)                                      | Publication<br>date                          |
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